

UNIT 3

Variables

Variables

- Must be one word, no spaces
- Most languages do not allow punctuation characters
- Most languages do not allow the first character to be a number
- Name a variable something that indicates what may be stored in it
- Variables can be from
 - User input
 - Created with a set statement
 - Result from calculations

Variable Declarations

- A *variable declaration* includes
 - variable's name
 - variable's data type
- Data Types
 - Integer – stores only whole numbers
 - Real – stores whole or decimal numbers
 - String – any series of characters
- Must be declared before they are used
- Should be initialized to some value

Declare Real creditsTaken

Numeric Literals

- Unassigned numbers
- A number written without a decimal point is assumed to be an Integer
- A number written with a decimal point is considered to be Real
- If you do assign a type and use the decimal point incorrectly, an error will occur
- Many languages do allow an integer to be assigned to a real variable

Integer Division

- Dividing two integers will result in a truncated integer
- For example

$$10 / 5 = 2$$

$$13 / 5 = 2$$

- It is not 2.6 because everything after the decimal point is dropped
- Java, C++, C and Python use integer division

Named Constants

- A named constant is a name that represents a value that cannot be changed
 - Makes programs more self explanatory
 - If a change to the value occurs, it only has to be modified in one place

Constant Real creditsTaken

- If a set statement or any other command tries to change the value of a named constant, an error will occur

Desk Checking

- Also called Hand tracing is a simple debugging process for locating hard to find errors in a program
- Involves creating a chart with a column for each variable, and a row for each line of code

Documenting a Program

- External documentation
 - Normally called a user manual
- Internal documentation
 - Also called comments
 - Explains how parts of the program works

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